

OPERATING INSTRUCTION

SENSOR GMF 700 IR for refrigerants



GMF 700 IR for refrigerants

IMPORTANT!

The device may only be operated if this operating instruction has been understood and is applied.

The annex "Safety for installers and operators" must be observed! If it is not available, please ask for it.

Sensoric

The sensor GMF IR 700 is operated with an infrared sensor long lifetime.
The signal is converted within the measuring range of the signal power range 4-20mA.

The sensors provide a corresponding output signal, that can generate in a evaluation device, over a load resistor to ground, an analyzable signal voltage.

Assembly

The sensor is designed for wall mounting.
Please refer to the relative gas density to air for proper mounting height.

Sensor connection

To supply the gas sensor 700 IR GMF, a DC voltage of 12 - 35V is needed.

As sensor-feed a shielded cable, such as JY(St) is to be used.
On the sensor, the shield wire should be connected to the device.
The bare shield wire must not come into contact with the circuit.

The other wire colors can be assigned as follows:

red => +24V (terminal V+), white => 4-20mA (terminal I), black => 0 V (terminal GND)

The shield wire is drilled to the evaluation unit with the yellow wire and to connect to the protective conductor (terminal 4 to the evaluation unit). This should only be done when the sensor housing is not already grounded by the assembly.

Equipment

Zero gas (synthetic air)
Calibration gas (40% .. 100% of range)
Gas feeding valves (flow controllers, flow meters, 0-1 liters / min)
suitable gas feed adaptor

Acceleration

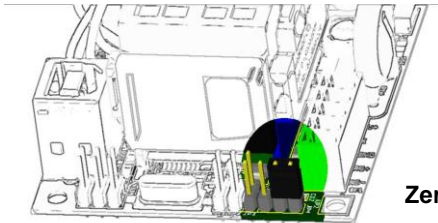
The output current is 2 mA firstly, then a jump occurs to 4 mA.
During the warm-up time, the sensor signal can vary around the value of 4 mA.

After 2 minutes the stable measuring operation is achieved.

Setting instruction

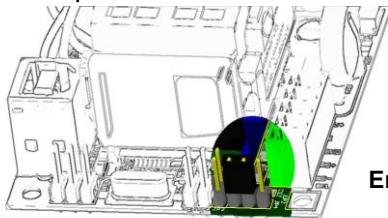
Before setting, the sensor must be in operation for 30 minutes.
The test gas must have ambient temperature, i.e. the same temperature as the sensor.

1. - Pressurize zero gas and rinse the measuring cuvette completely with it.
- Plug a jumper JP4 to position 1-2 and wait about 20 seconds.
The output current should fall to 4 mA.
- By removing the plug are stored the current values and the zero point calibration is complete.



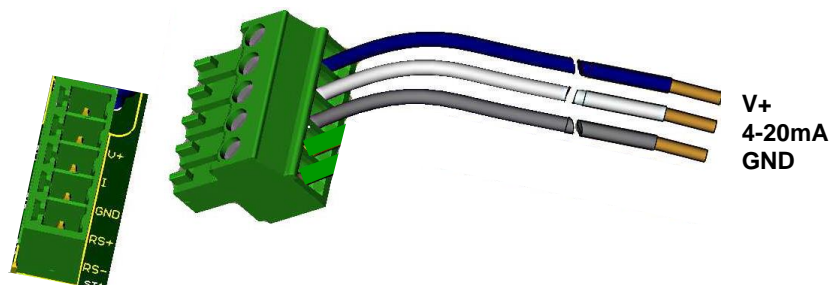
Zero point calibration: Jumper to JP4, Pin 1-2

2. End-point calibration:
- Supply test gas with the value of the full scale value of the sensor and rinse measuring cuvette completely with it.
- Plug a jumper to position 2-3 and wait about 20 seconds.
The output current should rise to 4 mA.
- By removing the plug are stored the current values and the end-point calibration is complete.



End-point calibration: Jumper to JP4, Pin 2-3

Terminals for GMF 700 IR for refrigerants



Commissioning

The adjustment of the sensor must be checked at the commissioning by supplying a test gas

Maintenance

In order to up-keeping the functional reliability a maintenance at predetermined intervals is required. The maintenance interval is taken from the inspection sticker on the evaluation device. It is no longer than 1 year.

Decommissioning

If the sensor is longer than 4 weeks out of service, it must be checked with test gas and recalibrate if necessary.

Technical details:

Measuring principle: infrared light absorption, 2 wavelenght

Gas type: various refrigerants

Measuring area: 0..2000 ppm, factory set

Accuracy: +-2% of measuring area

Starting time: < 120 sec

Response time T90: < 30 sec

Temperature range: -10..+40°C

Humidity range: 0..95% RH

Pressure range: 800-1200 hPa

Housing: aluminium LxWxH: 100x100x80mm

Protection type: IP44

Gas entry: diffusion

Output signal: 4-20mA, linear

Max. load: 125 R

CE-conformity: emission: residential, immunity: industrial environment

Weight: 450g

Supply: 12-28V DC / approx. 70mA average, max. 140 mA

Connecting cable: bis 500 m: JY (ST) Y 2x2x0,8 mm²,

Status as of July 2012

Subject to technical change

General features

Measurement principle: Non Dispersive Infra-Red (NDIR), dual wavelength

Measurement range: dependent on model - see list ⁽¹⁾

Gas supply: by diffusion (atmospheric pressure)

Dimensions: 72 mm x 55 mm x 34 mm (L x W x H)

Warm-up time: < 2 minutes (start up time)

< 30 minutes (full specification)

Measuring response ⁽²⁾

Response time (t_{90}): Appr. 30 s

Digital resolution (@ zero): 1 ppm / 0.1 % LEL / 0.01 Vol.-% ⁽¹⁾

Detection Limit (3σ): $\leq 1\%$ FS⁽³⁾ (typically)

Repeatability: $\leq \bullet$ } 1 % FS⁽³⁾

Linearity error ⁽⁴⁾: $\leq \bullet$ } 2 % FS⁽³⁾

Long term stability (zero) ⁽⁵⁾: $\leq \bullet$ } 2 % FS⁽³⁾ over 12 month period

Long term stability (span) ⁽⁵⁾: $\leq \bullet$ } 2 % FS⁽³⁾ over 12 month period

Influencing variable ⁽⁶⁾

Temp. dependence (zero): $\leq \bullet$ } 0.1 % FS⁽³⁾ per °C

Temp. dependence (span): $\leq \bullet$ } 0.2 % FS⁽³⁾ per °C

Pressure dependence (zero): -

Pressure dependence (span): 0.1 % to 0.2 % value per hPa ⁽¹⁾

Electrical inputs and outputs

Supply voltage: 12 to 28 V DC \bullet } 5 %

Supply current: 70 mA average, max. 140 mA

Power consumption: < 1 Watt

Analogue output signal: 0 - 20 mA linear

4 - 20 mA linear

0 - 1 V linear (with 50 Ω)

0 - 2 V linear (with 100 Ω)

Maximum load: 125 Ω

Digital output signal: Modbus ASCII via RS485

Calibration: zero and span by jumper or SW

Climatic conditions

Operating temperature: -10 °C to 40 °C

Storage temperature: -20 °C to 60 °C

Air pressure: 800 to 1200 hPa

Humidity: 0 % to 95 % rel. humidity (not condensing)